CLAIMS

1. A method of despreading a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message comprising the steps of:

- providing data message information relating to the timing of an epoch of at least one data bit of the target signal; and

- performing a correlation of the target signal and a replica signal containing corresponding PRN code sequences using the data message information to minimise degradation of the correlation caused by variations in the PRN code sequences in the target signal attributable to modulation by the data message.

2. A method according to claim 1 wherein the correlation is timed so as to substantially avoid continuous correlation over an epoch of a data bit.

3. A method according to claim 2 wherein the correlation is timed so as to occupy more than 80% but less than 100% of the data bit width.

4. A method according to claim 2 or claim 3 wherein a correlation output is provided as a function of the sum of correlation values returned for a series of individual, continuous correlations.

5. A method according to claim 1 wherein the data message information further comprises data bit information relating to at least part of the data message; and wherein the correlation is modified as a function of the data message information.

6. A method according to claim 5 wherein a continuous correlation occurs over a time period in which an epoch of a data bit occurs separating data bits of differing polarity.

7. A method according to claims 5 or 6 wherein a continuous correlation occurs over a time period greater than the transmission period of a single data bit.

8. A method according to claim 7 in which continuous correlation occurs over a time period 10 times greater than the transmission period of a single data bit.

9. A method according to claim 8 in which continuous correlation occurs over a time period 50 times greater than the transmission period of a single data bit.

10. A method according to any of claims 5 to claim 9 wherein data bit modulation of the PRN code sequences in the target signal is the same as or equivalent to exclusive-or modulation; and wherein the polarity of PRN code sequences in the replica signal is selectively reversed as a function of the data message information.

11. A method according to any of the preceding claims wherein pseudorandom noise (PRN) code sequences of the target spread spectrum signal are modulated by a data message, at least part of which is cyclically repeated, and wherein at least some of the data bit information is predicted based on a previous data message.

12. A method according to claim 11 wherein data bit information based on a previous data message is known to be substantially constant from one message to the next.

13. A method according to claim 12 wherein upon the identification of data bit information having a likelihood of being incorrect, alternative correlations are performed based on other possible formulations of the data bit information.

14. A method according to claim 13 wherein the viterbi algorithm is used in order to establish the most likely data bit sequence.

15. A method according to claim 14 wherein upon the identification of data bit information having a likelihood of being incorrect, the correlation reverts from a continuous correlation over data epochs to summing the moduli of individual correlations timed between data epochs.

16. A method according to any of the preceding claims wherein the target signal is a GPS signal and is received by a mobile unit; and wherein the data message information is provided from another GPS spread spectrum signal which has already been received and acquired at the mobile unit (hereafter "the reference signal").

17. A method according to claim 16 wherein the data message information relating to the timing of an epoch of at least one data bit of the target signal is derived from the timing of an epoch of at least one data bit of the reference signal.

18. A method according to claim 17 wherein the data message information relating to the timing of an epoch of at least one data bit of the target signal is derived from the timing of an epoch of at least one data bit of the reference signal using GPS ephemeris data.

19. A method according to any of claims 16 to 18 wherein the dwell time for each code check made whilst attempting to acquiring the target signal is greater than that previously used to acquire the reference signal.

20. A method according to any of claims 16 to 19 wherein the data message information further comprises data bit information relating to at least part of the data message of the target signal which is derived from corresponding data bit information of the reference signal.

21. A method according to any of claims 1 to 15 wherein the target signal is received by a mobile unit, and the data message information is provided at a base station.

22. A method according to claim 21 wherein the base station comprises a transmitter and the mobile unit comprises a receiver adapted for communication with the base station whereby the data message information is transmitted from the base station to the mobile unit; and wherein the correlation is performed within the mobile unit.

23. A method according to claim 22 wherein predicted data bit information is transmitted to the mobile unit in advance of the mobile unit receiving the corresponding portion of the data message in the target signal.

24. A method according to claim 22 or claim 23 wherein the base station and the mobile unit each comprise a transmitter and a receiver adapted for two-way communication with each other; wherein the target signal is a GPS signal; and wherein position information relating to the position of the mobile unit is transmitted from the mobile unit to the base station.

25. A method according to claim 24 wherein the mobile unit is mobile cellular telephone and the base station is one of a plurality of such base stations used in a cellular telephone network and situated at respective geographical locations to define a corresponding plurality of overlapping service areas constituting one or more regions.

26. A method according to claim 21 wherein the base station comprises a receiver and the mobile unit comprises a transmitter adapted for communication with the base station, and wherein the target signal received by the mobile unit is transmitted to the base station.

27. A method according to claim 26 wherein the correlation is performed at the base station.

28. A method of despreading a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message as hereinbefore described with reference to the accompanying figures.

29. A mobile unit for despreading a spread spectrum signal by a method according to claims 16 to 20 and claims 22 to 25.

30. A mobile unit comprising a receiver for receiving a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message, and a signal containing data message information relating to the timing of an epoch of at least one data bit; and a processor for generating a replica signal containing PRN code sequences corresponding to those of the target signal and performing a correlation of the target signal and the replica signal; wherein the data message information is used to reduce degradation of the correlation caused by variations in the PRN code sequences in the target signal attributable to modulation by the data message.

31. A mobile unit according to claim 30 wherein the correlation is timed so as to substantially avoid continuous correlation over an epoch of a data bit.

32. A mobile unit according to claim 31 wherein a correlation output is provided as a function of the sum of correlation values returned for a series of individual, continuous correlations.

33. A mobile unit according to claim 30 wherein the data message information further comprises data bit information relating to at least part of the data message, and wherein the correlation is modified as a function of the data message information.

34. A mobile unit according to claim 33 wherein a continuous correlation occurs over a time period in which an epoch of a data bit occurs separating data bits of differing polarity.

35. A mobile unit according to claim 33 or claim 34 wherein data bit modulation of the PRN code sequences in the target signal is the same as or equivalent to exclusive-or modulation; and wherein the polarity of PRN code sequences in the replica signal is selectively reversed as a function of the data message information.

36. A mobile unit according to any of claims 30 to 35 wherein the data message information is provided from another spread spectrum signal which has already been received and acquired at the mobile unit (hereafter "the reference signal").

37. A mobile unit according to claim 37 wherein the data message information relating to the timing of an epoch of at least one data bit of the target signal is derived from the timing of an epoch of at least one data bit of the reference signal.

38. A mobile unit according to claim 37 in the form of a GPS receiver wherein the target signal is a GPS signal; and wherein the data message information relating to the timing of an epoch of at least one data bit of the target signal is derived from the timing of an epoch of at least one data bit of the reference signal and GPS ephemeris data.

39. A mobile unit according to any of claims 36 to 38 wherein the dwell time for each code check made whilst attempting to acquiring the target signal is greater than that previously used to acquire the reference signal.

40. A mobile unit according to any of claims 36 to 39 wherein the data message information further comprises data bit information relating to at least part of the data message of the target signal which is derived from corresponding data bit information of the reference signal.

41. A mobile unit according to claim 30 to 35 in the form of a cellular telephone for use with a cellular telephone network and comprising a GPS receiver, wherein the signal containing data message information is provided from a cellular telephone network base station.

42. A mobile unit for despreading a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message as hereinbefore described with reference to the accompanying figures.

43. A base station for despreading a spread spectrum signal by a method according to claim 27.

44. A base station comprising a receiver for receiving from a mobile unit a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message received by the mobile unit, means for providing data message information; and a processor for generating a replica signal containing PRN code sequences corresponding to those of the target signal and performing a correlation of the target signal and the replica signal; wherein the data message information is used to reduce degradation of the correlation caused by variations in the PRN code sequences in the target signal attributable to modulation by the data message.

45. A base station according to claim 44 wherein the correlation is timed so as to substantially avoid continuous correlation over an epoch of a data bit.

46. A base station according to claim 45 wherein a correlation output is provided as a function of the sum of correlation values returned for a series of separate, continuous correlations.

47. A base station according to claim 44 wherein the data message information further comprises data bit information relating to at least part of the data message, and wherein the correlation is modified as a function of the data message information.

48. A base station according to claim 47 wherein a continuous correlation occurs over a time period in which an epoch of a data bit occurs separating data bits of differing polarity.

49. A base station according to claim 47 or claim 48 wherein data bit modulation of the PRN code sequences in the target signal is the same as or equivalent to exclusive-or modulation; and wherein the polarity of PRN code sequences in the replica signal is selectively reversed as a function of the data message information.

50. A base station for despreading a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message as hereinbefore described with reference to the accompanying figures.

51. The combination of a mobile unit according to any of claims 30 to 35 and a base station, wherein the target signal is received by the mobile unit, and the data message information is provided at a base station.

52. The combination of a mobile unit and a base station according to any of claims 44 to 50.

53. A combination of a mobile unit and a base station for despreading a target spread spectrum signal containing pseudorandom noise (PRN) code sequences modulated by a data message as hereinbefore described with reference to the accompanying figures.